Why Shape Matters - On the Inherent Qualities of Geometric Shapes for Cartographic Representations

Table S1. Hierarchical agglomerative cluster analysis dissimilarity matrix. Frequencies according to Phi-Square.

Proximity Matrix
Phi-square between Sets of Frequencies

| Case	1:Circle	2:One_point_circle	3:Semicircle_small	4:Semicircle_big	5:Triangle	6:Square	7:Pentagon	8:Ocatogon	9:Star_4	10:Star_5	11:Star_8	12:Star_spiked
1:Circle	,000	,536	,541	,524	,642	,688	,655	,673	,837	,811	,803	,775
2:One_point_circle	,536	,000	,509	,592	,682	,761	,794	,749	,824	,826	,819	,664
3:Semicircle_small	,541	,509	,000	,692	,805	,820	,876	,809	,924	,886	,899	,799
4:Semicircle_big	,524	,592	,692	,000	,781	,810	,849	,768	,953	,919	,933	,784
5:Triangle	,642	,682	,805	,781	,000	,360	,396	,325	,809	,802	,795	,692
6:Square	,688	,761	,820	,810	,360	,000	,483	,405	,945	,887	,899	,831
7:Pentagon	,655	,794	,876	,849	,396	,483	,000	,578	,893	,882	,858	,832
8:Ocatogon	,673	,749	,809	,768	,325	,405	,578	,000	,878	,839	,856	,781
9:Star_4	,837	,824	,924	,953	,809	,945	,893	,878	,000	,537	,505	,518
10:Star_5	,811	,826	,886	,919	,802	,887	,882	,839	,537	,000	,574	,542
11:Star_8	,803	,819	,899	,933	,795	,899	,858	,856	,505	,574	,000	,505
12:Star_spiked	,775	,664	,799	,784	,692	,831	,832	,781	,518	,542	,505	,000

This is a dissimilarity matrix
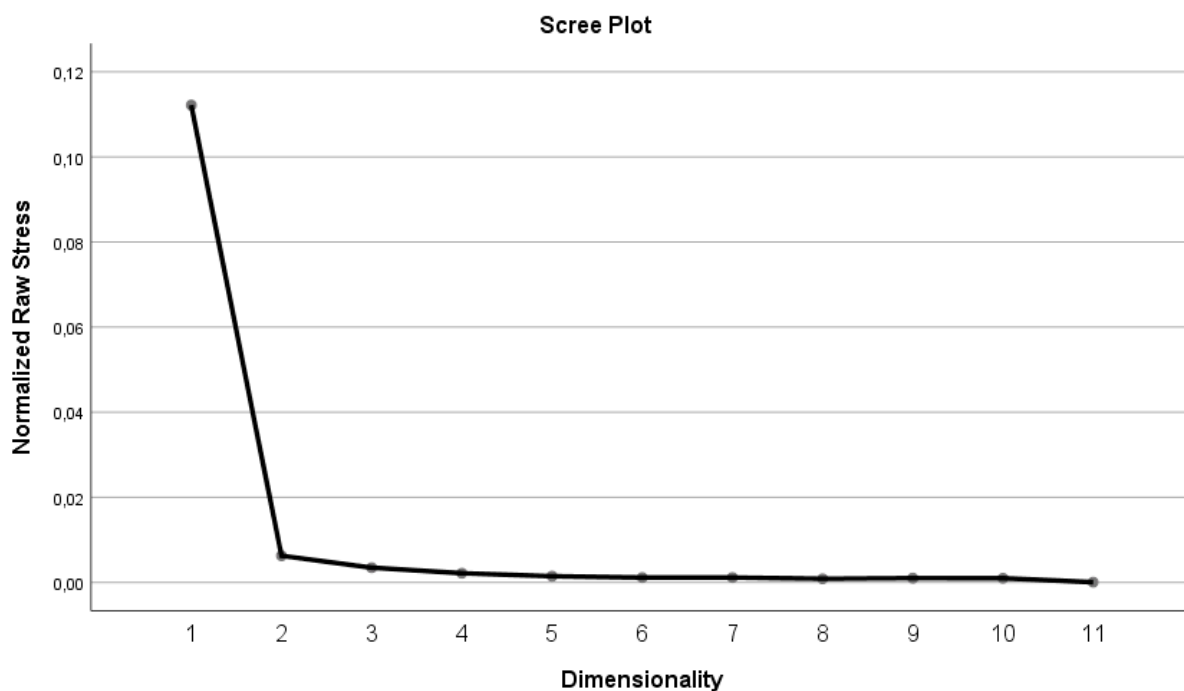
Figure 1. Scree plot based on PROXSCAL MDS for ordinal data, based on the 12x12 co-occurrence matrix, indicating a two-dimensional configuration.

Table S2. Goodness of Fit for a two-dimensional MDS configuration, based on a 12x12 co-occurrence matrix.

Stress and Fit Measures	
Normalized Raw Stress	,00604
Stress-I	,07770[a]
Stress-II	,16993[a]
S-Stress	,01483[b]
Dispersion Accounted For (D.A.F.)	,99396
Tucker's Coefficient of Congruence	,99698

PROXSCAL minimizes Normalized Raw Stress.
a. Optimal scaling factor = 1,006.
b. Optimal scaling factor = ,997.

Table S3. Coordinates for Common Space by applying a two-dimensional MDS configuration, based on a 12x12 co-occurrence matrix.

	Final Coordinates	
	Dimension	
	1	2
Circle	-,199	,436
One_point_circle	-,107	,629
Semicircle_small	-,240	,682
Semicircle_big	-,328	,696
Triangle	-,342	-,511
Square	-,554	-,425
Pentagon	-,452	-,567
Ocatogon	-,458	-,467
Star_4	,733	-,136
Star_5	,682	-,176
Star_8	,688	-,186
Star_spiked	,578	,024

Table S4. Excerpt of the inductive category formation process and coding results of coder 1 (translated from German). Coding scheme: C – Cartographic associations, O – Object associations, E – Evaluative-Affective responses (valence, dominance, arousal), H – (visual) Hierarchy, S – (visual) Symbiosis/Containment, F – Figurative description.

ID	Group	Condensation of the retrospective verbalizations – task 2	Transcriptions of (hand written) free-labeling – task 3	Coding – task 2 & 3	Category
1	1	A "here I am"-point	*Position marker*	C	Association
	2	Symbols to indicate locations	*Symbols for favorites*	C	Association
…	…	…	…	…	…
3	1	Shapes with edges, traffic signs	*edgy*	F, O	Visual, Association
	2	Curves	*curvy*	F	Visual
…	…	…	…	…	…
35	2	Basic shapes	*Basic shapes*	H	Visual
	3	Cartographic markers	*(Point-)markers*	C	Association
	4	This is anything & nothing, different from the others, rather non-special	*rounded*	E, F	Evaluation, Visual
	5	Rather aggressive	*prickly*	E	Evaluation
…	…	…	…	…	…
38	6	Pointing the way	*pointing the way*	E	Evaluation

Table S5. Cross-tabulation of female versus male responses of the three strategies identified, based on results of coder 1 (n = 19 females, n = 19 males).

		figurative	symbiosis	hierarchy	cartography	object	evaluation	Total
Counts of female versus male responses of codes (labels) based on coder 1								
Cross-tabulation								
Codes (labels) and categories assigned based on coder 1								
		visual			associative		affective	
female / male	f	55	1	10	6	11	19	102
	m	52	2	12	17	18	19	120
Total		107	3	22	23	29	38	222
Total by strategy			132			52	38	